FARM INDEX

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Population Shuffle

Outlook

Our farm income watchers bear good tidings. ESCS economists place this year's net farm income—not counting inventory changes—in the neighborhood of $25 billion. That's $4 or $5 billion over 1977, exceeded only by those exceptional years of 1973 and 1974.

USDA's earlier projection called for little or no improvement in 1978, but fatter livestock receipts in recent times have brightened the picture. Brisk activity in the export market has added zest to the income outlook as has heavy producer particpation in programs which, in effect, supplement farmers' earnings with Government checks.

Gross income never better. A record $119 billion is what our economists predict for this year, some $13 billion more than last. The livestock sector will consume most of the gain, thanks to smaller supplies and higher prices. Crop prices bounced back in recent months, though prices for some of the crops—cotton, soybeans, and feed grains—continued to trail year-ago levels.

Final accounting. Livestock receipts are seen $8 or $10 billion over 1977's $47 billion . . . receipts from crop marketings, up a billion or so from around $48 billion. Farmers are getting conservation and disaster payments as usual, but deficiency payments are on the rise. Too, Uncle Sam is offering new payments for diversion of feed grain and cotton acreage.

Granted, production expenses will eat up most of the larger serving in gross income. On the other hand, farm numbers continue to shrink, so real earnings per farm may actually expand this year. And, the increase in incomes, in current dollars, should about maintain the purchasing power farmers had in 1977.

Ample credit. Farmers generally aren't hard pressed for loans, but like most everything else, interest rates are creeping up. In early 1978, producers were paying 16 percent more on farm real estate debt than the year before—the sharpest leap in many years.

On the other side, greater availability of emergency loans from Farmers Home Administration and the Small Business Administration has eased financial stress. There's also been a swifter flow of loans from the Commodity Credit Corporation, plus wheat deficiency payments to build deposits at commercial banks and to increase loan payments at banks and the Production Credit Associations.

Healthy farmland market. Though it's doubtful the rise in farmland values will equal the sharp annual increase of 1973-77 (14 to 25 percent), it's going to be a good year.

In the year ended February 1, 1978, nationwide values averaged $490 an acre, or 9 percent over the previous 12 months. Best bet for predicting average 1978 figures is to watch world agricultural production. If it's as large as last year, expect a rise of 4 to 8 percent. "Low" world output, the likes of 1973, could spell a hike of 10 to 15 percent.

Input story. Farmers can expect to pay 6 to 8 percent more for production items in 1978,compared with a year ago. Much of the acceleration lies ahead.

On the demand side, feed buying will pick up due to gains in output of fed cattle and poultry. Feeder livestock purchases will rise also, reflecting heavier placements of cattle in feedlots.

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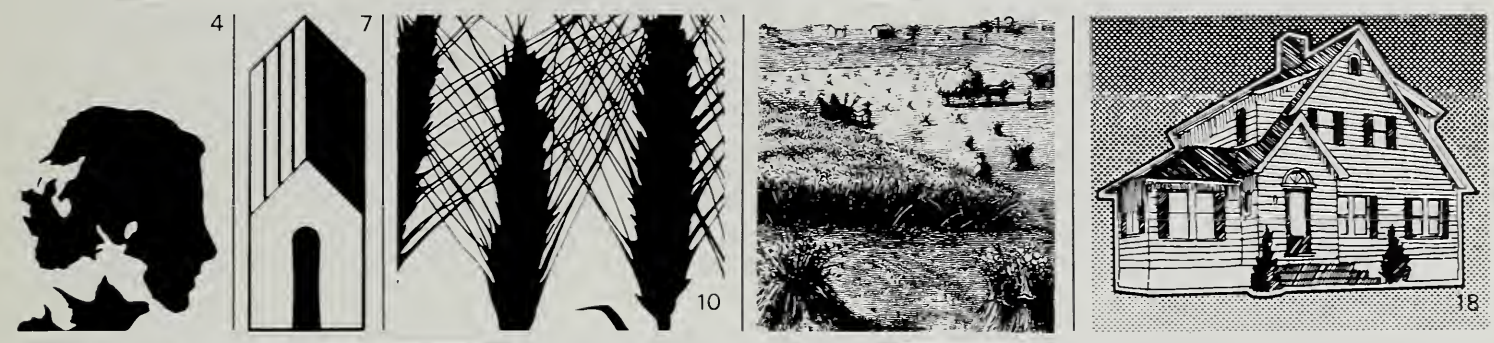

Features

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Population Shuffle

The South has asserted itself once again—it has bucked the Nation's "back-to-the-country" trend of the seventies.

While many Americans in other regions have been bidding city life *adieu* and moving to the country, the magic of the southern cities still twinkles. This is not to say that the southern countryside has no charm, as indeed it does—nonmetro areas in the South gained 6.9 percent in population during 1970-75.

But the metro areas grew more—9.3 percent.

Compare these figures with other regions: In nonmetro areas, the South—percentagewise—grew about as fast as the Northeast (7 percent), much faster than the North Central (3.4 percent), but considerably slower than the West (13.4 percent).

In metro areas, the South overtook all regions, with the West coming the closest with 7.4 percent—almost 2 percent short of the South's rate. The North Central lagged far behind with 1.2 percent growth, and the Northeast actually lost ground, declining a tenth of 1 percent.

By South, the demographers mean 16 States and the District of Columbia: the 11 States of the Confederacy plus Oklahoma, Maryland, Kentucky, West Virginia, and Delaware.

The whole picture. Before we take a more indepth look at the South's population patterns, let's glance at the U.S. as a whole.

Between 1970 and 1975, nonmetro counties in the U.S. received a net inmovement of about 1.8 million people—thus reversing a long-term trend. In the 1960's, the same counties reported a net outmigration of about 3 million, on the heels of a 5-million loss during the 1950's.

And this 1970-75 nonmetro gain is not limited to the spillover from the cities—that is, suburbanization. True, the counties bounding the cities grew by 7 percent, but the more distant nonmetro counties were close behind with 6 percent.

Distant growth. This 6 percent, although below the rate of the suburbs, was still higher than the average for either metro counties or the entire U.S. These nonadjacent counties—which account for nearly half the Nation's counties, but contain only 13 percent of the people—shifted from a migration loss of 2.3 million in the 1960's to a gain of 700,000 in the first half of this decade. Hence, the recent "back-to-the-country" phenomenon.

Note, however, that this rural growth has not been even. Exclusive of urban

sprawl, nonmetro population growth has been most highly associated with retirement counties, with most agricultural counties still losing population.

Retirement defined. Retirement counties are so designated on the basis of high inmigration of persons 60 years old or over. Many of these counties are in the Florida and southwestern "Sunbelts," but clusters are also found in the old cutover region of the Upper Great Lakes (especially in Michigan), the Ozarks, the hill country of central Texas, the Sierra Nevada foothills in California, and the east Texas coastal plain. In general, coasts, lakes, reservoirs, and hill country are favorite locations.

During the study period, retirement counties received a net total of 207,000 persons of all ages each year, compared with only 62,000 annually during the sixties. And the number appears to be on the increase.

Agricultural counties, on the other hand, have not even been absorbing the equivalent of their natural population increase. In fact, those counties with 30 percent or more employed in farming in 1970 actually had a net outmovement of 100,000 during 1970-75. However, the national population trend has had some impact in that the loss in these counties has slowed. During the 1960's, these same counties had about a 400,000 net outflow.

Return to the South. Now, let's go back to the South—which follows a different drummer than the national trend.

Between 1970 and 1975, the South's population increased by over 8 percent, or 5.3 million. Allowing for natural increase, the region's net population gain through migration was 2.6 million. By contrast, between 1955 and 1970, the South had a consistent net inmigration of just over 300,000 per 5-year period, and before that—1950 to 1955—had a net loss of 1.6 million.

Thus, in less than a generation, the South has gone from a traditional exporter of people to an attractor.

Prior to 1970, the large number of people moving to Florida kept the migration loss for the South as a whole to a minimum. However, during 1970-75, Florida's large net inmigration—which itself was double its 5-year average over the previous two decades—was matched by equally large migration into the rest of the region.

It is this migration into the remaining southern States that is considered one of the most striking developments of the seventies.

Nonmetro influence. This decided shift has been due almost entirely to the nonmetro counties. During the 1960's, small southern towns and rural areas had a net average loss of about 187,000 per year. In the first half of this decade, though, these same areas netted a gain of almost 150,000 annually.

The turnaround is also reflected in the sharp drop in number of counties losing population. In the 1960's, 515 or 46 percent of all southern nonmetro counties reported a decline; at mid-decade of the 1970's their number had dropped to 251. Concentrations of the counties losing population are in the Mississippi Delta and the Alabama Black Prairie areas, both of which have a high proportion of black population that developed during the years of the cotton plantation system.

However, among counties with 40 percent or more black population in 1970, net outmigration has dropped from an average of 46,000 people annually in the 1960's to 20,000 in the 1970's. Thus, even in these counties, some increased retention is evident.

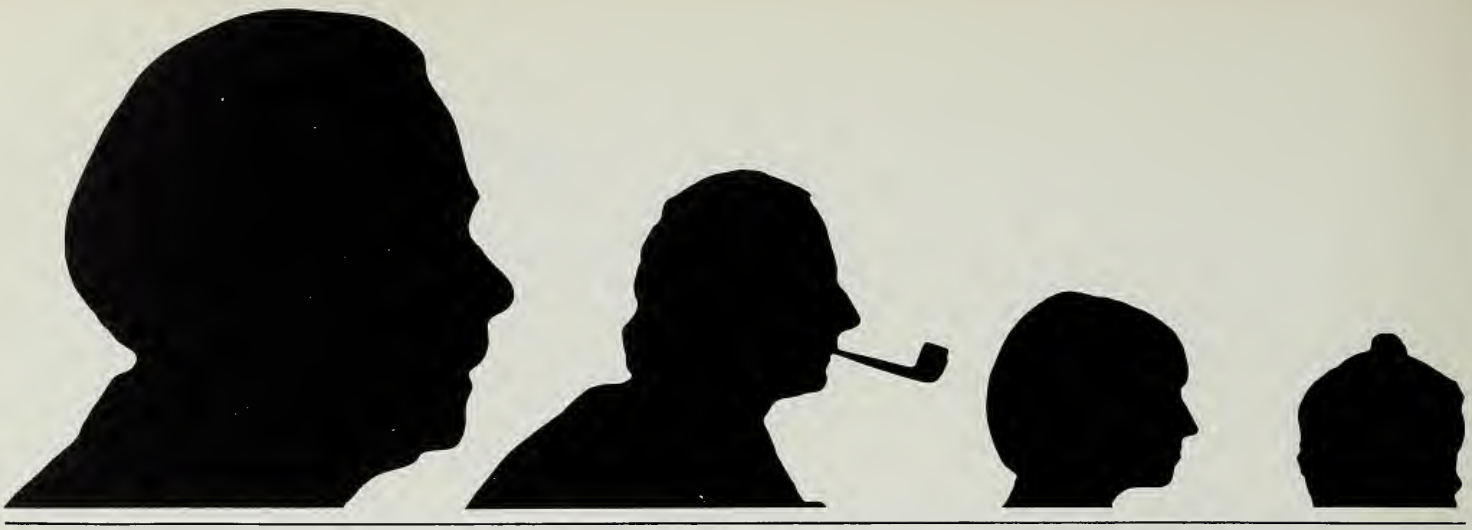
Farm exception. Improved retention in the South's nonmetro population as a whole does not extend to farm residents—80 percent of whom are located in nonmetro counties. Although the rate of loss has been somewhat lower in the 1970's than in the 1960's, the South's farm population continues its long-term downtrend—a trend in line with the rest of the Nation. Today, the South's farm population numbers only about 3 million and exerts little influence on overall nonmetro growth patterns.

As a reflection of its rural roots, the South today contains a much greater proportion of the Nation's nonmetro population than it does of the metro (43 percent vs. 28 percent). But it's in the metropolitan areas that the South sets itself apart from the rest of the Nation in population trends.

City dwellers. As in the other regions of the country, more than half the people in the South live in cities and towns. However, southerners tend to live in smaller towns than other Americans. To illustrate, the Census Bureau reports that in 1974, only about a fifth of the South's metro population was living in large (1.5 million) Standard Metropolitan Statistical Areas, compared with about three-fifths of the rest of the country's metro population.

This fact is significant in explaining why the South's metro/nonmetro population shifts come out differently than the other regions. For it's the bigger cities across the country that have generally suffered a population decline.

The South's smaller towns, on the other hand, have been attracting twice as many people as during the 1960's.



Demographically speaking, then, the small and medium-sized metro areas in the South are behaving more like rural areas than their big city cousins.

No one can say how long the current population trend will continue in both the South and the rest of the Nation. But the nonmetro revival and boost in small and medium-sized towns seem to have a momentum which will likely carry on for awhile.

People problems. And such a migration of people will require adjustments in both those counties losing population and those gaining.

In the areas suffering population decline, there are growing problems of too many public services and facilities—most notably, vacant and abandoned housing and vandalized, underused schools. Also, the outmigration tends to leave a large proportion of elderly people, often requiring economic aid for adequate health care and housing.

On the other hand, the areas on the receiving end of the population shift are challenged with meeting the needs of a changing age mix. For example, a greater demand is made for new housing and those services that go along with it, such as fuel, water, and sewer.

Too, if people are drawn to an area by industry, many of the workers have children, thus generating a need for more educational, health, and recreational services. And if "retirement" is the area's lure, there's often pressure for more leisure services as well as a need for adequate health care for the aged.

[Based on the paper, "A Review of Recent Nonmetropolitan Population Trends With Emphasis on the South," by Vera J. Banks, Economic Development Division, presented at the Second Workshop on Quality Housing for Rural Low-Income Families, Knoxville, Tenn., March 20-22.]

Farm Population Patterns

Farm population statistics hardly raise an eyebrow anymore, as they've been doing the same thing since they were first collected in 1920—declining. What is of interest, though, is how much they're declining and who's involved.

According to estimates prepared by ESCS and the Bureau of the Census, the 1977 farm population was approximately 7.8 million, down 5.4 percent from 1976. This means that about 1 out of every 28 people in the U.S. lived on a farm last year.

Going back to 1970, the farm population was 9.7 million, or almost 20 percent more than the current figure. And since the Nation's population as a whole has been increasing, the farm share has been decreasing—from 4.8 percent to 3.6 in the past 7 years.

However, the rate of decline has differed significantly by race. During 1970-77, the average annual rate of decline among white farm residents was 2.5 percent, compared with 10.3 for blacks.

To illustrate, there were 850,000 blacks on farms in 1970; by 1977, only 400,000. Thus, their share of the total farm population fell from 9 percent to 5.

Age is a factor, too, in farm population statistics. Since 1970, the number of farm children under 14 years of age has fallen by nearly 38 percent, compared with 13 percent for older farm residents. Much of the drop in the younger set, though, can be blamed on the declining national birth rate during the early 1970's.

[Based on the manuscript, "Farm Population of the United States: 1977," by Vera J. Banks and Diana DeAre, Economic Development Division.]

Farm Population Statistics

Share of total population

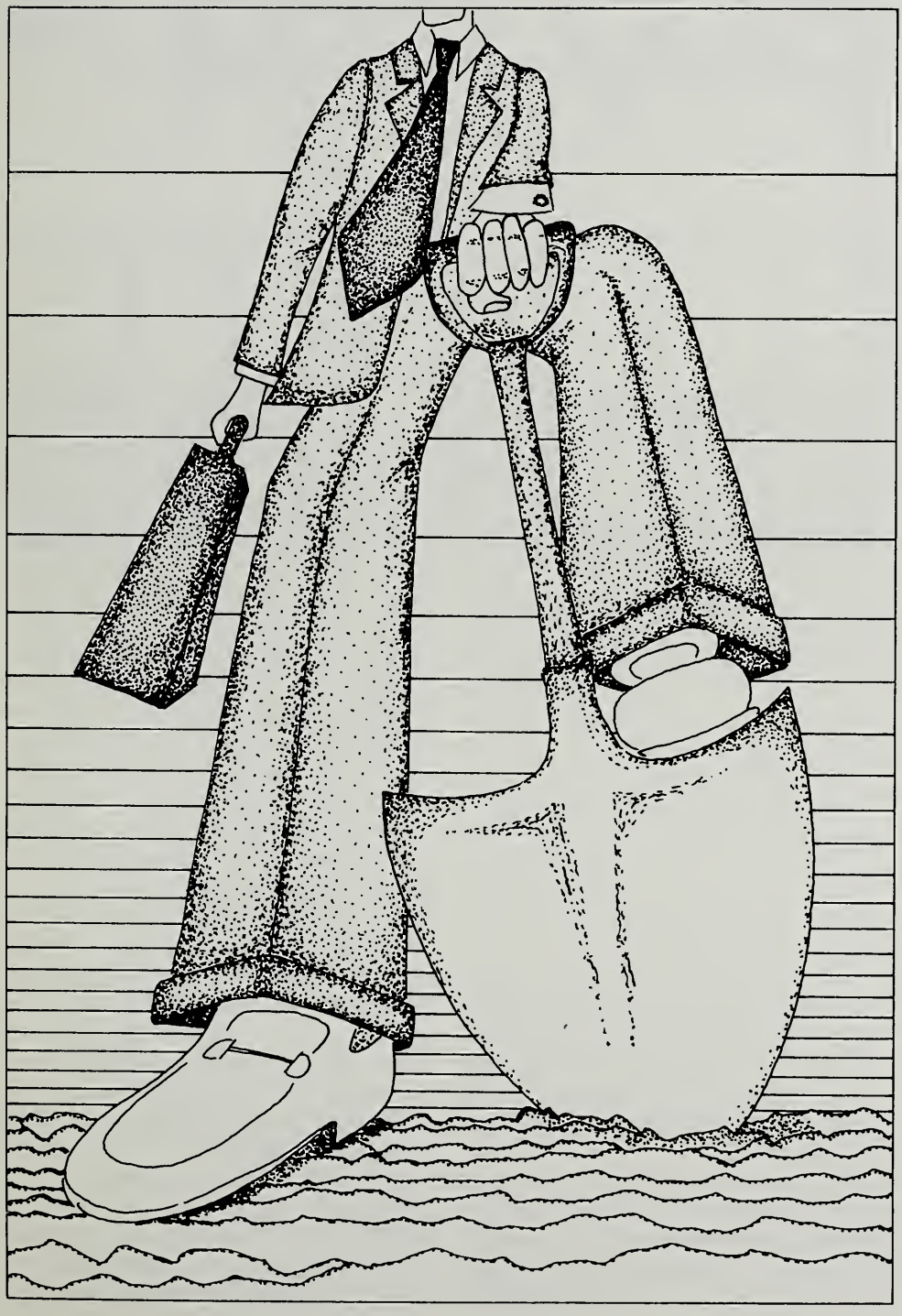
Year	Total U.S. resident population	Farm population: Number of persons	Farm population: Percent of total population
	1,000		
1970	[2]203,235	9,712	4.8
1971	205,677	9,425	4.6
1972	207,802	9,610	4.6
1973	209,468	9,472	4.5
1974	211,018	9,264	4.4
1975	212,542	8,864	4.2
1976	214,284	8,253	3.9
1977	215,915	7,806	3.6

Race and age breakdown

Race and age	Farm population 1970	Farm population 1977	Percent distribution 1970	Percent distribution 1977
	1,000			
Race:				
White	8,775	7,349	90.4	94.1
Black	849	397	8.7	5.1
Age:				
Under 14	2,490	1,555	25.6	19.9
14 and over	7,222	6,251	74.4	80.1

[1]Five-quarter averages centered on April. [2]Official census count.

Finding a Homestead



Editor's Note: Rural land-use policy is becoming increasingly crucial in this age when industrial, residential, agricultural, and environmental forces converge and compete for rural land. To aid in governmental decisionmaking, ESCS researchers have looked into the past for clues to future land-use trends.

To officials in America's rural counties, the population shifts of the 20th century may offer a colossal headache.

After all, these officials and their predecessors saw the farm population peak early in the century, and then suffer a long spiraling decline. Job opportunities in rural areas did not expand fast enough to employ the former agrarians.

Unemployment. Declining job opportunities in extractive industries during the recent past made the employment situation in rural America even worse. As unemployed and underemployed rural people fled to urban areas, rural population growth stagnated.

Now after years of trying to shore up rural economies and provide jobs to stop the migratory drain on rural human resources, local officials may face a new trend with its own set of problems.

In the 1970's, the trend toward decentralization of industry has resulted in the growth of nonfarm job opportunities in nonmetro counties at twice the rate as in metro counties. This has been accompanied by a net migration of population to nonmetro America that

has been four times greater than to metropolitan areas.

Boons and banes. Along with the obvious economic benefits, this wave of urban immigrants has brought a myriad of new problems for rural counties, ranging from increased police and fire protection needs to demands for better schools and hospitals.

Perhaps equally important, the urbanites' new-found fondness for countryside living—along with a similarly rising popularity among industries for rural land—has forced rural planners to take a hard look at land-use policies.

Considering that agriculture, industry, commerce, and residential developers all need or want prime rural land, who should have first priority? How can the land be fairly and wisely allocated? What is in the best interests of the public?

Still other pertinent questions to be raised are: How long will this urban-to-rural trend last? And how strong will it be?

Clues in the past. To help anticipate future demands and needs, the planners may find some clues in past settlement patterns in America.

Early American settlers faced a different set of problems as they sought prosperity in the New World.

With an almost limitless supply of land before them, their major hurdle was to find just the right tract of land that offered good soil and terrain for their crops, ample wood for shelter and fuel, and good transportation. (Such manmade obstacles as boundaries, Indian opposition, and edicts by foreign kings proved no match for the pioneers' hunger for land.)

Water was the most attractive answer to the transportation barrier, so settlers

clustered in small farms near the coast and along navigable rivers and creeks. It was time consuming and more arduous to move a family and livestock across land, and it was difficult to transport surplus produce for trade.

Self-sufficient farmers. Colonial farmers were, generally, self-sufficient—out of necessity. For the few goods and services a farmer couldn't produce or perform for himself, he called on one of the isolated craftsmen scattered across the countryside, or on a peddler.

As land transportation improved with an increased supply of horses and with roads slowly being worn onto the land, villages and towns sprouted along these routes as centers for bringing together the resources for manufacturing, trade, and services.

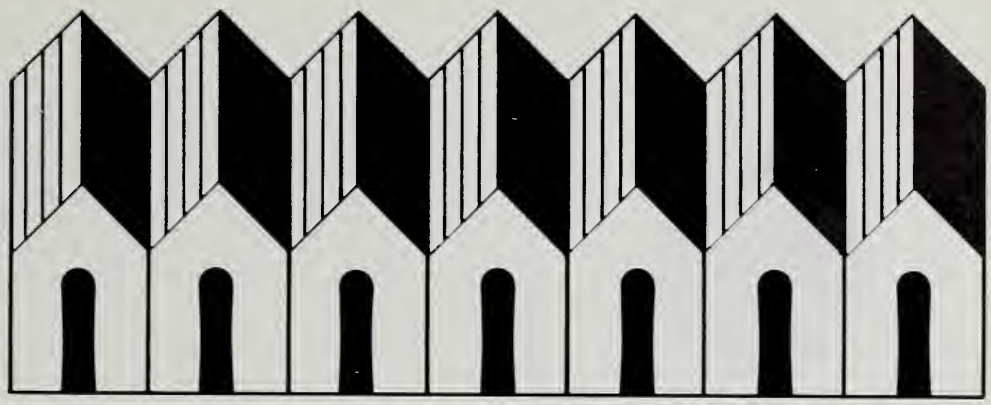
The growth of villages and towns, then, served the practical need of reducing transportation by efficiently allowing farmers to take care of an assortment of needs with one trip, rather than having to track down scattered craftsmen.

The relative prosperity of cities—much like that of farms—also depended largely on the convergence of resources.

Ideal locations. Cities prospered and grew most rapidly at two types of locations. At convenient transportation junctions—generally beside navigable water—brisk trade centers flourished where agricultural surpluses were exported, and manufactured goods and other special products were imported.

Manufacturing cities sprouted near difficult-to-transport resources, such as water, power, forests, and ores. As people poured into these industrial cities to seek manufacturing jobs, others came to work at transporting finished goods, and at supplying the workers' needs. Since the primary transportation within such cities was by walking, people had to live near jobs and stores.

The advent of steam power and railways modified the settlement pattern in the mid-19th century, by making



overland travel and movement of goods vastly faster and cheaper, thus reducing the importance of navigable water in determining settlement patterns.

Coming of technology. Steam power and railways also accelerated trends toward industrialization and concentration of population. The automobile and mass transit systems made it possible for the counter trends of suburbanization, deconcentration, and decentralization to come about. Instantaneous communication—telephones, electronics media, etc.—also made decentralization easier.

As cities grew so crowded, many people yearned for a less hectic environment. With easy and efficient transportation, urban people and businesses relocated in suburbs near such attractions as clean air and open space.

Mechanization. The effects of improved transportation and communication were not limited to cities. On the farms, mechanization allowed fewer and fewer people to work larger and larger acreages. Chemical developments for fertilizers, pesticides, and herbicides fueled this trend toward fewer farmers.

The automobile and bus also allowed more efficient servicing of rural needs. Schools could be consolidated with wide-ranging school busses. Small rural hamlets also experienced a decrease in business, as people could easily drive to larger towns to shop.

The loss of farm jobs and employment in small towns forced a migration to cities where jobs were more plentiful.

The recent budding of the reverse trend toward location of industry in rural areas is now allowing more rural people to find work near their homes and enabling a new net flow of urban people to the countryside since 1970.

Blurred boundary. One off-shoot of the easy transportation—which is facilitated by a nationwide web of super highways—is that the distinction between rural and urban areas is now blurred.

With fast and cheap transportation, people who work in cities—and people who work on farms—can enjoy many of the advantages of both city and country life. To enable easiest movement—rural and suburban residents and businesses locate beside good roads.

Modern concerns and problems seem to hold a potential for yet other significant changes in the U.S. settlement patterns.

On one hand, enviromental concerns seem to point to continued decentralization of industry, and dispersal of population.

Easing pollution. Such a trend would possibly ease air and water pollution by diluting and dispersing toxic substances and other pollutants.

On the other hand, greater dispersal requires more energy to maintain the same level of interaction. And higher energy means higher transportation costs and a greater drain on existing fossil fuel sources.

The trend toward dispersal of population and industry accelerates the rate of loss of farmland and open space and bodes greater competition for the use of farmland. More land may be needed for agricultural or forest production at the same future time when rural land is in demand for residential or industrial development.

Another environmental concern is that development of land for agricultural and urban uses may disrupt natural ecosystems by destroying wildlife habitats.

Land use restrictions. Many State and local governments are already reacting to these concerns by restricting the diversion of agricultural and unique rural land to nonrural uses. Development is being discouraged by stricter zoning, establishment of agricultural districts, preferential assessment of agricultural and open space land, and by establishing and buying development rights.

These restrictions on the supply of high-quality rural land for residential, commercial, and industrial uses will greatly affect evolving settlement patterns.

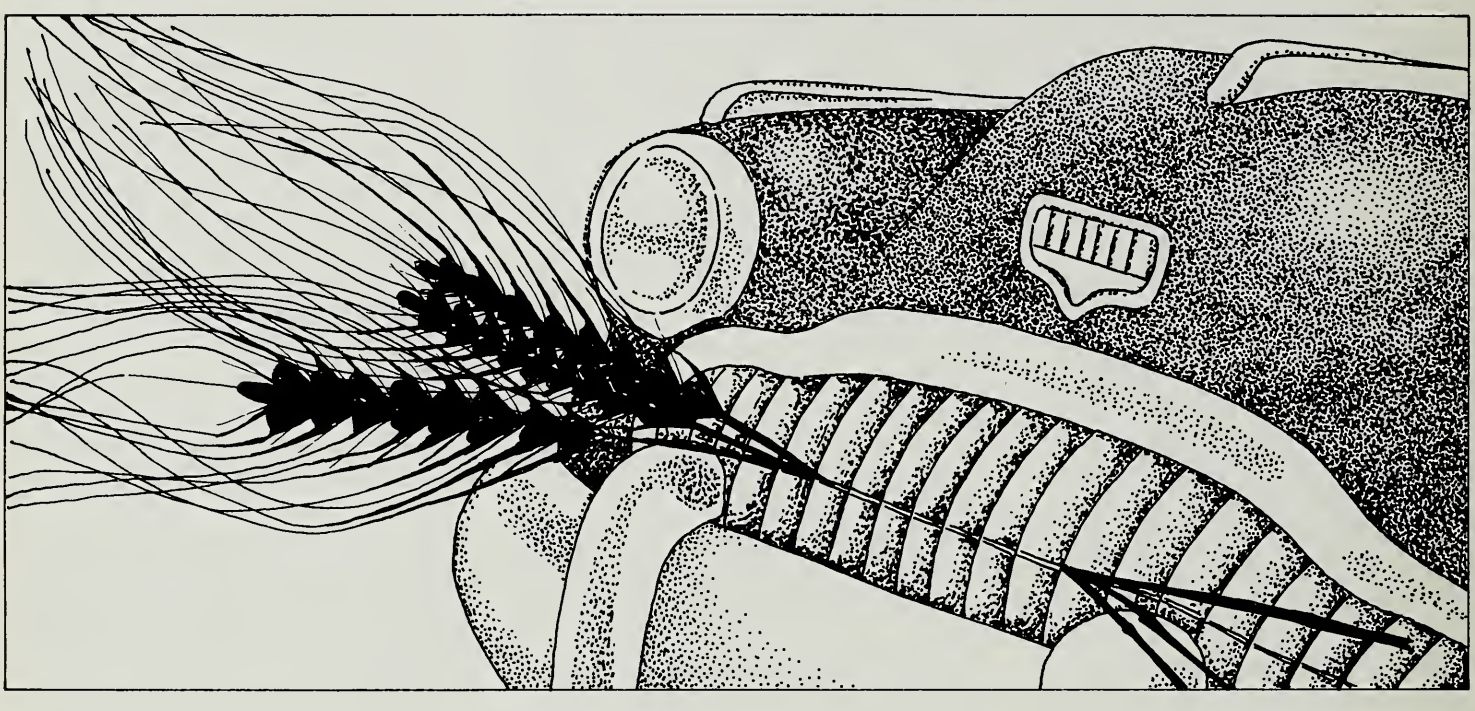
Land prices for urban uses will increase, along with construction costs for building on hilly or poorly drained land. So will installation costs for utility lines and roads.

Rougher commuting. Such restrictions may also lengthen communications and transportation lines and, in turn, increase the time and cost of commuting and shopping. Low-income groups would be most adversely affected by the increased housing, utility, and transportation costs.

These budding considerations offer delicate alternatives to rural governmental planners who must protect farmland while allowing the beneficial economic growth that movement into the rural counties can bring. Meanwhile, the developers must seek new ways of getting the maximum use from land that will become increasingly limited in both quantity and quality.

[Based on the paper, "Evolution of Settlement Patterns" by Kathryn A. Zeimetz, Natural Resource Economics Division, presented March 20-22 at the Second Workshop on Quality Housing for Rural Low-Income Families, in Knoxville, Tenn.]

Gasohol: Grains for Fuel?



Researchers are turning to agriculture to help the Nation out of its energy and surplus grain problems. But that turn isn't new—it was first taken in the 1930's.

"Because of the paramount importance of motor fuels in modern civilization . . . numerous efforts have been made in recent years to develop substitute motor fuels with which to augment petroleum.

"Petroleum deposits are irreplaceable, and at present rates of consumption cannot last forever."

Moreover, the U.S. needs an outlet for surplus grain, particularly because "disturbed agricultural conditions have been experienced" recently.

The quotes are all from a USDA report, *Motor Fuels from Farm Products*, published nearly 40 years ago; but they're just as true today.

Drink it or burn it. Research has shown that alcohol made from grain—ethanol—can be mixed with gasoline to power some engines. Such a mixture, known as "gasohol," when blended in a 10-percent ethanol, 90-percent regular gasoline combination, may be substituted directly into gasoline-powered engines without engine modifications.

Using much more than 10 percent ethanol, however, often requires work on the engine, especially in the carburetor.

Major engine modifications are needed if ethanol is mixed with fuel for diesel engines.

Ethanol, also called grain alcohol, may be made from nearly any kind of grain. The main requirement is for the presence of starch or sugar for alcohol production.

Starchy and abundant. Grains work well for alcohol production. They're high in starch, and—especially right now—they're plentiful. But the economics of using U.S. grains for ethanol is being questioned by many experts.

According to some studies, if grain alcohol is to replace 10 percent of the gasoline used for fuel, 40 percent of the total grain harvest must be diverted to ethanol production.

Such a slice out of the grain supply would mean either supplies of grains for food and feed would be very tight—resulting in higher consumer prices—or farmers would have to boost acreage substantially.

This estimate is based on 1975 data. That year, Americans burned some 109 billion gallons of gasoline, and harvested about 10 billion bushels of grain. For a 10-percent gasohol blend, nearly 4 billion bushels of grain would be needed.

The waning of promise. Such massive use of grains for fuel, then, is not promising because of the quantity needed. And, there's another problem. This one is in the area of law and taxes. Because ethanol is the same as alcohol for drinking, many Federal and State laws regulate its production, especially regarding taxes. No small project would be needed to monitor the ethanol produced to determine which is made for drinking—thus falling under whiskey taxes—and which is produced for fuel. But there are other—perhaps more serious—problems with using grains for fuel.

It's unlikely the venture could ever be feasible economically. Assuming a 20-million-gallon ethanol plant was producing the fuel, estimated costs per gallon for ethanol are about $1.42. That's compared with oil refiners' costs of about 38 cents for a gallon of gasoline.

Unbalanced. But there's a potentially worse problem. Estimates are that, using corn, the energy balance for ethanol production is negative. That is, considering the applied fertilizer, the fuel used in planting and harvesting, pesticides applied, and all other inputs, plus the energy needed for the alcohol production process, it takes two Btu's to produce one Btu of ethanol—more energy is used than produced.

Taken together, these factors indicate the feasibility of using grains for energy will remain small, although some uses of gasohol from grain may prove worthwhile in local areas.

One factor that might help encourage ethanol use is the decreasing cost of gasohol production as production plants get larger.

Large plants needed. Most experts agree that a plant must be at least of the 20-million-gallon-a-year size to operate effectively. As the plants get larger, the per-unit cost of construction and operation slides down. To boost plant output 100 percent, costs would have to be raised only 60 percent.

Also, after the ethanol is produced, the grits that remain make good livestock feed, generally high in protein and quite saleable.

Gasohol and the Farm Act

The Food and Agriculture Act of 1977 had a lot to say about the use of farm products for energy. Congress approved the spending of up to $24 million to support research on farm-produced energy.

Last fall, USDA asked for ideas from the public for consideration as pilot projects to convert agricultural commodities and forestry products into industrial hydrocarbons and alcohols.

Besides these ideas, now being evaluated, USDA is already involved in studies using chicken waste and feedlot manure to make methane gas.

In addition, USDA is working closely with the Department of Energy to develop energy programs using solar energy and agricultural matter.

USDA also is continuing other energy programs, including conservation, building construction and insulation, and solar studies.

[Based on special material from Earle Gavett, National Economic Analysis Division.]

Although these positive aspects don't appear striking enough to offset the very high cost of operation, the future of alternative fuels from renewable resources for farmers isn't all bleak. Methanol may be an answer.

Methanol is another form of alcohol, only it uses different materials. Like ethanol, methanol may be mixed with gasoline in a 10-percent blend to produce gasohol.

Move with alcohol. And, as with the ethanol blend, this gasohol may power gasoline engines quite well.

Methanol, however, tends to separate from gasoline when it is not blended carefully, while ethanol mixes easily.

Also, methanol needs more heat for ignition than either gasoline or ethanol. So, engines with methanol are sometimes hard to start in cold weather.

To make methanol—or methyl alcohol—a wide variety or materials may be used. Coal, lignite, wood waste, agricultural residue—such as corn stalks or other cellulosic material that may otherwise go to waste—and plain garbage may serve as the basis for methanol production. (Some researchers have used cow manure for production of methane gas, a substitute for natural gas, but not a liquid fuel.)

Farmers are keeping an eye on the methanol research. While the widespread use of methanol wouldn't do much to clear away the huge grain stockpiles, the raw materials needed could add significantly to farm income someday.

[Based on "Gasohol from Grain—the Economic Issues," a report coordinated by Earle E. Gavett, National Economic Analysis Division, for the Task Force on Physical Resources, Committee of the Budget, U.S. House of Representatives; and on special material from Gavett.]

The Northern Plains: Ode to the Old West

This is the seventh in a series of articles on regional agriculture.

The early pioneers who settled the north-central part of the U.S. saw promise in the flat, monotonous apron of land that came to be known as the Northern Plains. And, to some people's way of thinking, that took a lot of foresight.

For one thing, the prairie sod was so tangled with roots that it had to rot 2 years before it was tillable. Violently capricious weather and skirmishes with the Indians added to the pioneers' lot.

But, where big bluestem and other tall grasses grew—some were tall enough to screen a cow from a man on horseback—man's own high grass, corn, could prosper. And, on drier soils where shorter prairie grasses spread, such as buffalo grass and little bluestem, man could grow his shorter grass, wheat.

Agricultural kingpin. Corn and wheat are still the area's principal crops, but cattle—which now thrive on the land where great herds of buffalo roamed—are the heart of the region's agricultural economy.

In 1976, for example, cattle and calves were the number one cash commodity in three of the four Northern Plains States—Kansas, Nebraska, and South Dakota. The only exception was North Dakota, where they came in second behind first-placed wheat.

The same year, the sale of livestock products averaged 55 percent of the region's total farm receipts—ranging from a low of 29 percent in North Dakota to a high of 79 percent in South Dakota.

Of the total livestock receipts, 73 percent were for cattle and calves, while hogs and dairy products—the only other major livestock commodities—trailed far back, at 16 and 8 percent, respectively.

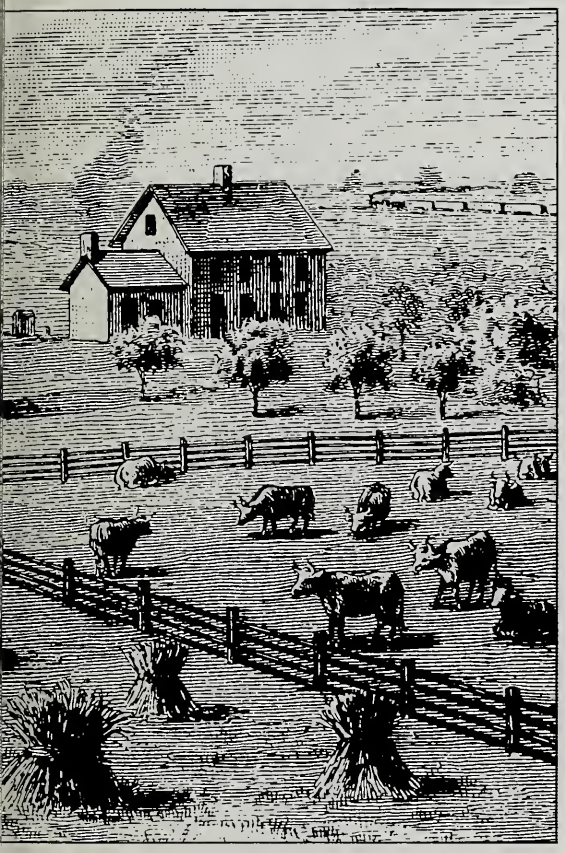
Top crops. On the crop side of the farm ledger, wheat and corn were the most valuable items, representing 41 and 28 percent, in that order, of the total crop receipts.

The success of these five commodities—cattle and calves, wheat, corn, hogs, and dairy products—helped Northern Plains farmers to net $1.7 billion in farm income in 1976, about 8 percent of the $21.9 billion that all farmers earned that year.

And with 9 percent of the Nation's farms and 17 percent of the land in farms, the region produced nearly $11 billion worth of farm goods in 1976—about 12 percent of the total farm output of $94 billion.

Top honors. Two Northern Plains States—Nebraska and Kansas—ranked among the top 10 farm States in 1976 (based on the value of cash receipts), coming in sixth and seventh, respectively. However, all of the States placed among the leading 10 States for cash receipts for some of the 25 top commodities. These included:

- Kansas—first in the Nation for wheat; sorghum grain, third; cattle and calves, fourth; hay, seventh; corn, eighth; and hogs, ninth.
- Nebraska—sorghum grain, second;



cattle and calves, third; corn, fourth; hogs, sixth; sugar beets, seventh; wheat, eighth; and hay, ninth.

• North Dakota—barley, first; wheat, second; sugar beets, fifth; and potatoes, eighth.

• South Dakota—cattle and calves, eighth; and hogs and barley, tenth.

Individuality. A closer inspection of the States reveals that each produces a number of specialty crops and boasts an agricultural history all its own.

Take Kansas, for instance. The Sunflower State's landscape is dominated by wheat, oil wells, and livestock. Known as the "breadbasket of the world," Kansas produced about 16 percent of the Nation's total wheat crop in 1976, including 22 percent of the Hard Winter wheat.

Kansas wheat's high-protein content and strong-gluten characteristics make it a prime candidate for bread making, and most of the high-quality wheat is used for that purpose.

Although the State's wheat crop is predominately a dryland enterprise, about 5 percent is produced on irrigated farmland—only about 4 percent of Kansas' farmland is irrigated, including nearly 7 percent of the cropland.

Irrigated crops. Wheat competes with corn, grain sorghum, alfalfa, and, to some extent, sugar beets for the irrigated acreage. (In 1976, nearly 80 percent of the corn for grain and 70 percent of the grain sorghum were grown on irrigated farmland.)

Neighboring Nebraska is the region's top agricultural moneymaker, even though most early explorers were almost unanimously unimpressed with the Cornhusker State.

Lt. Zebulon M. Pike, who traveled west along the Republican River in 1806, declared that this area of "barren soil, parched and dried up for 8 months of the year" would "become in time as equally celebrated as the sandy desert of Africa."

Maj. Long's prediction. And, in 1819, Maj. Stephen H. Long, after exploring the Platte River country, reported that the region was "almost wholly unfit for cultivation and uninhabitable for people depending upon agriculture for their subsistence."

Today, about 40 percent of the State's population live in rural areas, proving Maj. Long wrong.

Some of the most sparsely populated rural areas are located in the western part of the State, where such dryland operations as wheat and cattle production predominate.

Eastern Nebraska is the scene of more intensified crop farming (corn, soybeans, and sorghum), as well as hog production and cattle feeding—Omaha is one of the Nation's major livestock markets.

Expansion of irrigation. Because underground water is plentiful in many parts of the State, there has been an extensive development of irrigated farming—especially in those areas where the soils are deep and productive and rainfall is too low or uncertain to sustain intensive crop farming.

Since 1966, Nebraska farmland under irrigation has increased at a rate of over 200,000 acres per year, while new irrigation wells have been registered at an annual rate of more than 1,600. (In 1974, nearly 4 million Cornhusker acres were irrigated—about 8 percent of the total farmland and close to 18 percent of the cropland. By 1985, the total irrigated acreage is projected to jump to at least 7 million acres.)

A major concern. Utilization of Nebraska's water resources is a major public concern in the State. For if the current rate of irrigation development continues and there is no technological change to increase water use efficiency, the State will use twice the amount of water in 1985 as it did in 1970.

Such rapid development could mine underground aquifers in several areas to the point of exhaustion by the year 2000. This would greatly reduce the number of wells and their capacity.

A cutback in irrigation water would greatly affect the State's production of corn for grain, sugar beets, and dry edible beans—Nebraska is the leading

producer of Great Northern beans and comes in fourth in Pinto production.

State projects. Research on improved irrigation methods and an effort to educate farmers in more efficient water management will be important State projects over the next decade.

Irrigation is used extensively in only a few locations in South Dakota—Nebraska's northern neighbor. In 1974, less than 1 percent of the Coyote State's farmland and cropland was irrigated.

The largest Federal reclamation projects is Oahe Dam on the Missouri River, which provides water for farmland in the James River Valley. Besides the Government projects, other irrigation is used along the arid fringes of the Black Hills and in some of the humid eastern parts of the State.

Irrigation potential. South Dakota experts estimate that some 1.5 million acres are potentially irrigable, considering current economic conditions and technological know-how.

Additional irrigation would increase the State's gross farm income (especially from such crops as alfalfa hay, corn for grain, grain sorghum, soybeans, wheat, oats, barley, and potatoes) and stabilize livestock feeding.

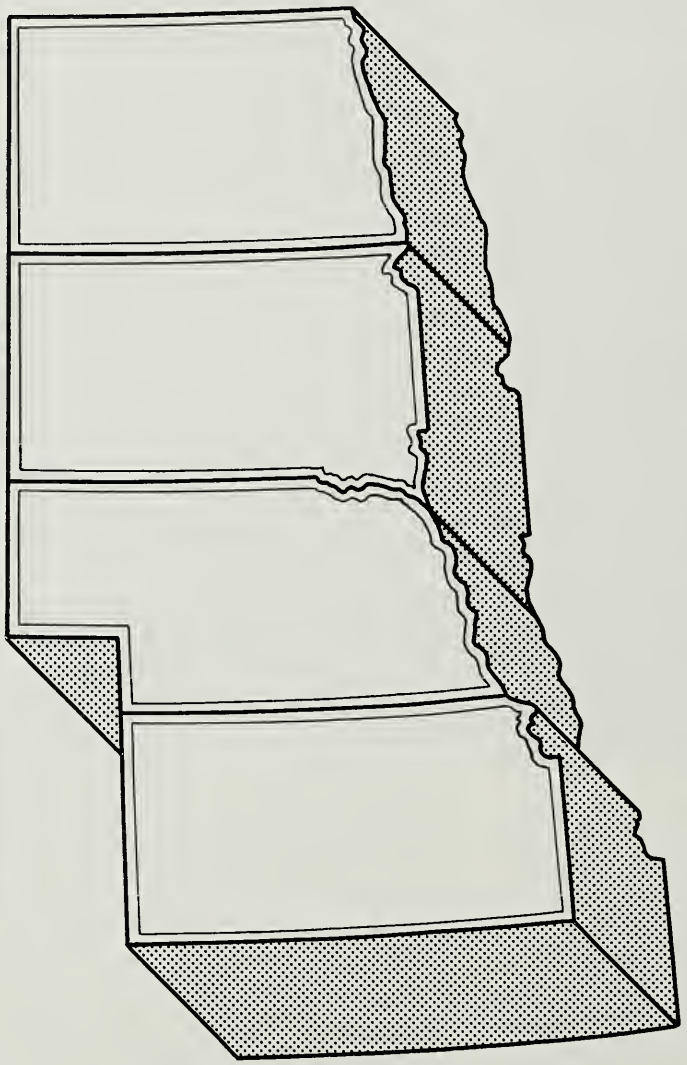
Besides the big money-making crops, such as cattle and calves, wheat, and corn (the golden kernel is grown in every South Dakota county), the Coyote State produces such specialties as honey (it usually ranks among the Nation's top three producers), wool, beeswax, and buffalo meat for research. That's right—buffalo meat.

Buffalo meat research. The State Experiment Station and the National Buffalo Association collect bottom round cuts from buffalos for new research on cooking methods and analyses of buffalo meat. Similar research has developed recipes for the preparation of venison and pheasant, as well as possible commercial uses of freeze-dried and smoked pheasant.

The remaining Northern Plains State, North Dakota, has the distinction of being "America's most agricultural State"—that is, a higher proportion of its State income is derived from agriculture than any other State (nearly 70 percent in 1976).

The Flickertail State leads the Nation in the production of two important

Leading Cash Crops for 1976



North Dakota

wheat
cattle and calves
barley
dairy products
potatoes

South Dakota

cattle and calves
hogs
dairy products
wheat
corn

Nebraska

cattle and calves
corn
hogs
wheat
sorghum grain

Kansas

cattle and calves
wheat
corn
hogs
sorghum grain

wheats. Its high-protein Hard Red Spring wheat is milled into flours used in bread making, while Durum is turned into semolina—a product contained in macaroni and other pastas.

Other honors. North Dakota also takes the trophy for the production of barley, rye, flax, and sunflowers, and ranks high for oats, potatoes, dry edible beans, sugar beets, honey, and American cheese.

Some of the finest black soils in the world lie in the State's famed Red River Valley, and one of the crops that thrives in the rich earth is potatoes.

Up until about a decade ago, North Dakota farmers emphasized the production of red-skinned spuds—Red River Reds were a trademark of the valley area and were known nationally.

However, with the advent of processing, white- and russet-skinned types cut into the production of the red varieties. Today, about 46 percent of the potatoes grown are red skinned; 45 percent, white skinned; and 9 percent, russet skinned. Almost half of North Dakota's potatoes are processed.

Red River rainfall. Besides its fine soils, the Red River Valley is blessed with more rainfall than the rest of the State—up to 18 inches per year on the average. Only a tiny proportion of the State's farmland and cropland—about 0.2 of 1 percent—is irrigated.

Unlike the neighboring Corn Belt and Lake States, farms are large in the Northern Plains—averaging about 800 acres in 1977 (about twice the national average of 397 acres). Acreage per farm was greatest in South and North Dakota.

An awesome 95 percent of the Northern Plains' approximately 194 million acres were in farmland in 1977; this compares with less than half for the Nation as a whole.

Like the rest of the country, the region has experienced a decrease in the number of farms since 1935, while the average size has increased.

The changing face of agriculture. Agriculture has changed over the lifespan of the four States: Farming and ranching are now capital-intensive, high-risk businesses, with prices rising in virtually every area of the farmers' needs, while prices received for crops and livestock are often low and unpredictable.

Agriculture has moved dramatically into the technological age. As farms grow larger and more complex, machinery has replaced much of the farm labor force, and farm management has become very scientific.

Yet, hope remains an essential characteristic of the Northern Plains farmer. That hope, a century old, is reflected in the names the pioneers gave their settlements: Fairmount, Fortuna, Fairbury, Grand Island, Fairway, Garden City, even Hope itself. Such names are a testimony to the optimism the early settlers felt in this land.

That optimism still renews itself today, as agriculture remains the region's principal occupation.

[Based on special material from Thomas Frey, Natural Resource Economics Division; Donald Durost, Wayne Rasmussen, and Tom Fulton, National Economic Analysis Division; Charles Porter, Commodity Economics Division; F. C. Humphrey, North Dakota State University, John Pates, South Dakota State University, Phil Holman, The University of Nebraska, and Chet Unruh, Kansas State University, all with the Cooperative Extension Service.]

Wheat Story

Wheat is big business in the Northern Plains—the area produces more than a third of the Nation's total each year.

So it's no surprise that the region is constantly searching for more productive, disease-resistant varieties, especially since some experts believe that wheat varieties should be replaced about every 5 years.

Kansas is the country's leading wheat State, thanks to its ability to produce high-quality Hard Red Winter wheat, which is used in bread making.

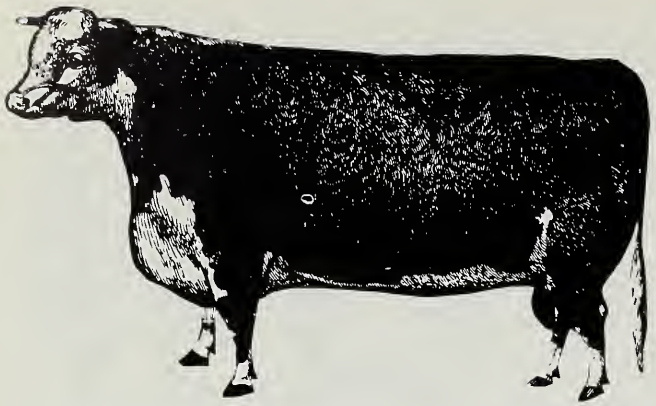
Today's Hard Red Winter varieties were developed as improvements to the Crimean wheat—sometimes called Turkey—brought to Kansas in 1873 by Russian Mennonites.

Turkey wheat's popularity was slow to catch on, because its hardness required special types of milling equipment for producing flour. However, its resistance to freeze and frost damage caused researchers at the Kansas Agricultural Experiment Station to take a second look, and by the end of the century, Turkey wheat was on its way to widespread acceptance.

Mark Carleton, a wheat researcher at USDA, heard of the successes of the Kansas wheat (which, among other qualities, could survive the scourge of black stem rust), and planted experimental plots of the hardy crop.

Carleton was so impressed with Turkey wheat that he traveled to Russia, searching for new varieties of the Hard Red Winter wheat. The work that he carried on at the Department established this type of wheat as one of the Nation's major varieties.

[Based on special material from Wayne D. Rasmussen, National Economic Analysis Division.]



Cattle and the Northern Plains: A Historic Duo

Like the neighboring Mountain States, the Northern Plains played an active role in one of the most colorful chapters of American agricultural history—the great western cattle drives.

The drives began in Texas, where there was an abundance of cattle and no buyers. In 1865, the Lone Star State's ranges were overstocked with some 6 million head. Up north, it was a different story—supplies were low and prices good.

Soon after the Civil War, thousands upon thousands of tough Texas longhorns were driven to the rich and plentiful grazing lands of the Plains States, where they were fattened on the special grasses before shipment to Chicago for slaughter.

Other herds were driven straight to the railroads in Kansas for immediate shipment to market or to the corn-producing States of the East—many easterners would only eat corn-fed beef.

Cow towns sprang up at almost every western railway terminal, and some of them became famous. Abilene, Dodge City, Wichita, and other towns in central and western Kansas once resounded to the gunfire and hoof clatter of trail-driving days and provided ample work for lawmen such as Wyatt Earp and Bat Masterson.

Before long, the Northern Plains was supporting a massive cattle industry, and many of the herds were foreign owned—British and Welsh investors were particularly active. In South Dakota, for example, more than 40 British companies were involved in that State's early cattle business.

Some European investors attempted to set up meatpacking plants, such as the one built in 1883 by the Marquis de Mores near Medora, N. Dak. This venture, and others like it, failed, because the eastern market demanded corn-fattened cattle.

The prospects of open range cattle ranching lured many young adventurers to the Northern Plains. Perhaps the most famous cowboy was Theodore Roosevelt, who punched cattle in the Badlands of North Dakota in the 1880's.

This open range era was gradually replaced by the ranch cattle industry. A number of factors contributed to the evolvement, including the severe winter of 1886-87, which killed up to 75 percent of the cattle in some locations. This catastrophe convinced many ranchers that cows and calves could not be run on the open range without some provisions for feed and shelter in the winter.

One of the biggest boons for the new era of the cattle industry was barbed wire, which made fencing the land possible. This eventually led to the development of better beef cattle by controlled breeding.

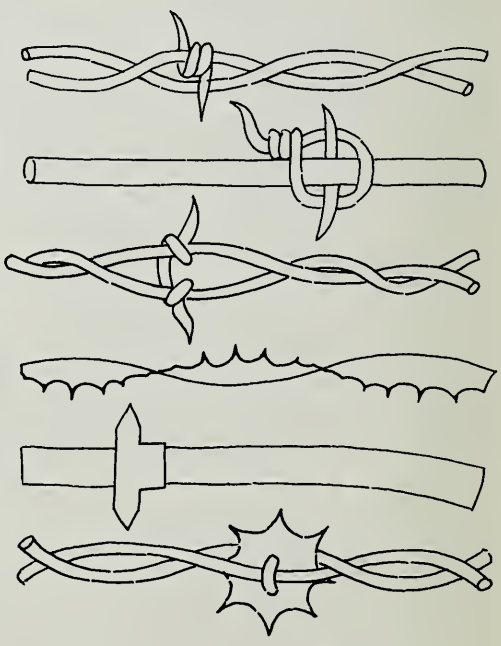
[Based on special material from Tom Fulton, National Economic Analysis Division.]

The Wire That Tamed

Called "treacherous, truculent, tempermental, and just plain mean," barbed wire did as much as any single invention to end chaos and bring demarcation to the limitless horizons of the range.

The first U.S. patent adding barbs to the wire that had been used for years to keep animals and trespassers *out* came in 1867; within a short time hundreds of variations had been produced to keep livestock *in*. That change of concept revolutionized farming and ranching.

Today, collectors may still find examples of early wire types on overlooked posts or in out-of-the-way yards. Among them (top to bottom) are: Glidden's "The Winner," 1874, remarkably like modern types; Reynold's "Necktie," 1878, of the "vicious" type designed to punch cattle; Decker's "Spread," 1884; "Sawtooth," early 1880's, of the easy-to-see "obvious" type designed to warn stock away;



"Brink Flat," 1881; and Hodge's "Spur Rowel," 1887.

[Based on an article in the map series, "Close-up: USA," published by the National Geographic Society, 1974.]

The Shrinking Farm Work Force

Out of a decade of change has come a new farm labor force, younger and fewer in number.

The number of hired farmworkers declined 12 percent in the decade between 1964-66 and 1974-76, according to figures from the Hired Farm Working Force Survey of 1976.

Accompanying this decrease was a change in the composition of the work force. For example, the ranks of farm laborers are becoming younger. The number of older workers aged 25-64 dropped 26 percent during this period, sending the median age of hired farmworkers from 25 years in 1964-66 to 23 years in 1974-76. By the mid-seventies, young people under 25 comprised almost 60 percent of this farm work force.

Also, black workers are comprising a much smaller share of the hired farm work force. This group has dropped by 50 percent over the 10-year period, while whites stayed about the same.

Women in the labor force. Meanwhile, the proportion of women in the hired farm labor force hasn't changed much. It hovers right around 26 percent most years.

The bulk of the hired workers do not live on a farm. Only 22 percent of this work force listed a farm as residence in 1974-76. Ten years earlier, 30 percent of these workers lived on a farm. But the trend toward nonfarm residence is slower now than it was prior to 1964-66. The number of people living on farms has slipped to about a third of the number that lived on farms in the 1940's.

The strength of the hired farm work force was 2.8 million in 1976—a number that hasn't changed much since 1971—but many of these workers were students and housewives who did farmwork for only a few weeks out of the year.

Workers around the year. Only 12 percent of the people hired to do work on farms are year-round workers doing 250 days or more of farmwork. Another 10 percent do farmwork on a regular basis for 150-249 days a year. Together, these are the "professionals."

While they comprise only 22 percent of all hired farmworkers, they do the bulk of the hired farmwork—68 percent of it in 1976.

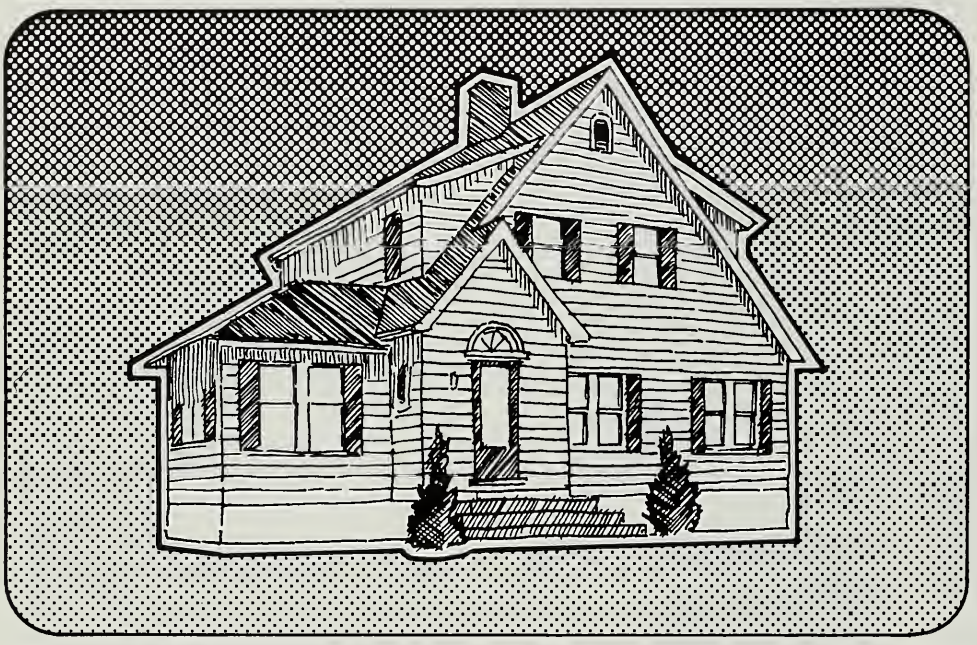
But the casual workers—those who hire out to farmers for less than 25 days during the year—are also important. While they comprise about 40 percent of the fired farm work force, they do only about 5 percent of the work on the farm. However, their contribution is especially important to some farmers during peak harvest periods when the demand for farm labor is high.

The importance of migrants. Another group of hired farmworkers—migrant workers—is also important to the planting and harvesting of the Nation's crops. In 1976, there were about 200,000 people who traveled across county lines to do farmwork. Since 1960, the number of people doing migrant farmwork has declined by almost 50 percent, although this number has remained about the same during the last few years.

Distances traveled by migrants during the year varied considerably, but almost a fourth traveled at least 1,500 miles to do farmwork, not counting the distance to return home. Most of the short-distance migrants were white, while those traveling long distances were Hispanics and blacks.

[Based on "The Hired Farm Working Force of 1976," by Leslie W. Smith and Gene Rowe, Economic Development Division.]

Weatherization: Insulating Against Costs



Summer is here, and now is the time shrewd Americans are weatherizing their homes.

For one thing, weatherproofing helps control summer heat by keeping cool air in and hot air out—important to both those with and without air conditioning.

Another reason for weatherproofing now—rather than waiting until the fall frosts are on the ground—is because it's cheaper. Weatherproofing materials will be considerably more expensive this fall, thanks to inflation and increased demand.

And because most people wait until winter is in the air before they begin to think about weatherization, materials may become scarce once the rush is on.

USDA effort. Since nearly a fourth of all the energy used in this country is for residential purposes, USDA is encouraging rural homeowners to weatherize their homes in an effort to conserve energy and cut costs.

The energy problem has had a more serious impact on rural residents, even though household energy expenditures don't differ greatly between rural and urban homeowners. The reason is that the lower income levels prevailing in rural America mean that a high portion of the typical household income must be spent for energy.

If 90 percent of the 23 million housing units in nonmetropolitan areas were weatherized to meet minimum Federal standards by 1985, experts say the energy saved would be equivalent to 488,000 barrels of oil a day, or 24 days of oil imports, at 1976 import rates.

What it would cost. The average cost of retrofitting the existing houses would be $550 (1975 prices), and household savings from reduced energy expenditures would pay for such investments in less than 5 years, assuming an interest rate of 8 percent.

On an individual basis, owners of a fully retrofitted house would experience a 35-percent reduction in fuel use. Owners of houses already partly weatherized, of course, would find the savings smaller.

Just how badly do the rural houses need weatherization? The 1975 Annual Housing Survey, conducted by the Bureau of the Census, showed that 42 percent of all nonmetro housing units had no storm windows and nearly 23 percent had no attic or roof insulation.

Adequacy of insulation. No information was obtained on the adequacy of existing insulation. However, according to the Department of Commerce, well over half of all rural homes needs additional attic insulation, and an even larger percent could economically benefit from other types of weatherization.

Because of regional differences in climate, variations in the degree of existing weatherization, differences in the cost of various fuels, and diverse living patterns among families, the economic soundness of additional investments in weatherization will vary greatly.

However, most households could significantly reduce energy expenditures with only modest investments of time and money. For instance, even in homes that are well insulated, caulking and weatherstripping around doors and windows can reduce air infiltration. A quarter-inch gap beneath a 36-inch door is equal to a 9-square-inch hole, and such gaps add up to big energy losses.

Value of insulation. Next to caulking and weatherstripping, insulation of attics and crawl spaces is generally the most beneficial weatherization investment.

While there are differences of opinion over how much attic insulation is economically justified, perhaps the overriding issue is that homes with little or

no insulation could benefit greatly, whether or not they reach the recommended R value (a measure of resistance to heat transfer) for the area.

Energy savings from adding insulation do not increase arithmetically as more insulation is added. Instead, with each additional inch of insulation, the extra energy saved is less than for the previous inch.

Greatest savings. Because of this diminishing rate of return to investments of insulation, the greatest savings per dollar invested result from the initial addion of insulation. With increasing energy costs, however, the amount of insulation that is economically justified also increases.

Determination of the optimum amount of insulation to be added in any home is influenced by the cost of the insulation materials and their installation, as well as the type of fuel used and the climate.

Do-it-yourself installation reduces the cost and justifies the installation of larger amounts of insulation.

Wall insulation. Because of the difficulty and expense of installing wall insulation in existing houses, its economic justification is less certain. The time to insulate walls is when housing is being constructed.

Savings resulting from investments in storm windows generally are sufficient to repay the cost of their installation within 7 to 10 years. Investments in storm doors are less economically justified at present energy costs.

Planting trees and shrubs to shade the house in summer, but to permit heating by the sun's rays in winter, can be a sound weatherization practice, even if energy savings are not immediately translated into dollars and cents.

Home management practices. Besides weatherization techniques, the typical household can reduce energy consumption by numerous home management practices. These include:

- Lowering thermostats in winter—generally reduces energy used in heating by about 3 percent for each degree of temperature.
- Closing drapes at night—buffers the air convention through windows.
- Periodic inspection and adjustment of home heating equipment—enhances its efficient operation.
- Humidity control—reduces the need for heating and cooling.

Fact sheets. Fact sheets on home weatherization and other energy conservation practices in housing are generally available to the rural public from the State Cooperative Extensive Service.

The Government Printing Office also has a number of useful reference materials, including: "In the Bank—Or Up the Chimney," "Making the Most of Your Energy Dollars," "Home Energy Savers' Workbook," "Ever Heard of Retrofit? A Guide for the Home Remodeler," and "Retrofitting Existing Housing for Energy Conservation: An Economic Analysis."

[Based on the speech, "Status of the Rural Energy Crisis," by Donald D. Steward, Economic Development Division, at the Second Workshop on Quality Housing for Rural Low-Income Families, Knoxville, Tenn., March 20-22, 1978.]

Housing Issues

The rapid escalation of energy costs in the last few years has had a big impact on the price of housing.

Three issues arising from this situation deserve special attention. They include:

1. *Quality control over production and installation of insulation materials.* Due to increased demand, the production of various insulation materials has become such a profitable venture for small businesses that some materials now on the market are of inferior quality.

The danger of this situation can be illustrated by a product such as cellulose, (often chopped-up newpapers), which, if not properly treated, can be a fire hazard or attract vermin.

Consumers are advised to check the quality of insulation materials carefully and deal with reliable suppliers and contractors.

2. *Location of housing.* Increasing transportation costs due to the energy situation will have some influence on the location of housing. Transportation to work and schools and easy access to shopping and community facilities and services will play an increasingly more important role in where people choose to live.

Federal programs and policies concerned with housing needs will have to consider the transportation factor.

3. *Financial assistance to low-income households.* Low-income households often lack the repayment ability to qualify for existing Federal credit assistance. If these families are to be helped in improving and maintaining the quality of their housing, other means of assistance will need to be provided.

Commodity Profile:

As Clean as a Sty

The key word for commercial hog production is efficiency.

Farmers who raise hogs look for methods that allow them to use less work hours per hog, and still turn out pork at a profit.

In other words, let machines do the work. But the machines are expensive, as are the total confinement operations many producers are turning to.

Total confinement—all operations, from birth to marketing, indoors—accounts for an increasing share of U.S. pork production.

For those farmers in areas with especially harsh weather, total confinement can add to production by allowing the farmer more control over the hogs' environment.

Less labor. But more important, total confinement allows the farmer to raise more hogs with the same amount of labor. Labor is a major part of production costs, which have mushroomed in recent years.

In 1970, for example, producers in Missouri—a leading hog producing State—figured they spent about $19 to get 100 pounds of pork to market. The farmer received $22 for that pork.

By 1976, hog prices doubled, but higher production costs virtually offset the increased revenue. The figures for 1977 will show about the same, and the 1978 costs might creep up a little, based on the costs of feed and labor.

An important aspect of total confinement is less flexibility in adjusting production levels. They change more slowly with total confinement, and farmers' year-to-year production shifts are more deliberate.

Taming wild production swings. A significant expansion of production would require new investment in facilities. And, to let facilities stand empty doesn't eliminate mortgage payments, so producers don't cut back as quickly, either.

Economists refer to this slowdown in production swings as "dampening the cycle."

Still, many farmers don't go the total confinement route. They seek other ways to boost efficiency, such as better feed, better hog breeding, and some structural changes in hog sheds.

Many of the changes in the sheds is in added insulation. Farmers have found that when hogs are protected from extremes in temperature, production is improved; it's faster and more efficient. Insulating the small hog sheds in open lot operations can pay big dividends at marketing.

Some light on efficiency. Estimates of how boosting efficiency helps a farmer are hard to make. But one statistic is enlightening: A very efficient producer—using the most modern production methods, including genetically improved breeding stock and a closely monitored feeding regimen—can turn out an average 220-pound hog in 5-6

months. A less efficient producer markets a 220-pounder in 7-8 months.

Total confinement, in some cases, can be a help in boosting efficiency. But the system presents problems of its own.

To start with, total confinement systems are expensive. A farmer can spend hundreds of thousands of dollars on one, including costs of construction, climate controls (heating and cooling), automatic feeders, and manure disposal.

Steep operating bills. And, operating costs can be rough. While labor costs are slashed because fewer people per litter are needed to keep things going, energy costs are higher than for other systems, and the costs of disease protection can be higher.

The increased stress that pigs are under in a confinement facility helps diseases get a foothold. And once a disease starts in a herd, it can spread like wildfire.

To douse the potential spark, producers rely heavily on disease prevention. Some farmers, through elaborate cleaning devices, keep the air in a hog barn nearly dust-free.

Along with technological innovations is a heavy reliance on medicines, especially antibiotics, usually mixed with feed. Their price adds to operating costs.

Strangling profits. Many farmers are concerned about efforts to outlaw antibiotics in feed. They fear that without these medicines, disease in total confinement operations would strangle profits.

Profits lately have been looking better than they have in years. Hog prices in the first quarter of 1978 were up 20 percent over a year earlier, the result of strong demand for red meat and production smaller than expected.

Farrowings (births) in December 1977 through February 1978 were down about 1 percent from December-February a year earlier—although producers had indicated last fall they had plans to expand by more than 10 percent.

Fewer farrowings. Cuts in farrowings are attributed to a hard winter and accompanying disease problems, and to producers having second thoughts about long-term profits.

Producers generally decided they'd be better off in the long run with higher prices from a smaller pig inventory.

This year's constricted supply put a strong shoulder to farm prices. For all of 1977, prices for live hogs averaged $41/cwt., but they could bounce to an average $46-48 this year; they hit $50 for barrows and gilts in January.

Whether total or partial confinement is the norm—and experts figure total confinement operations will increase in number—the number of farmers turning out hogs commercially will probably skid. In 1950, more than 2 million farmers produced hogs for sale. That plummeted to less than a half million 25 years later.

Pounds of pork. Total pork production, though, rose a little during that period—from 10.7 million pounds in 1950 to 11.5 million. Per capita consumption, meanwhile, drooped a little overall, from 69.2 pounds in 1950 to 58 pounds in '75, after bobbing and weaving in the company of supplies and prices—consumption was as high as 73 pounds in 1971, and as low as 55 pounds in 1975.

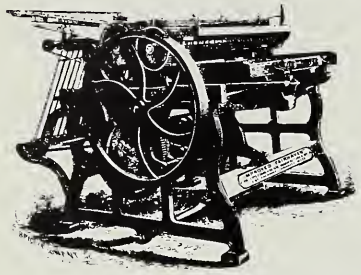
But through it all, the structure of the hog industry has taken its own course, to a tighter, more efficient business.

[Based on "Structural Characteristics of U.S. Hog Production," by Roy N. Van Arsdall, Commodity Economics Division, and on special material from Eldon Ball, CED, and Glen Grimes, University of Missouri, Extension Service.]

COMMODITY PROFILE: HOGS

Production:	13.1 million pounds of pork in 1977, 5 percent more than 1976
Value:	$7.6 billion in 1977, down 3 percent from 1976
Inventory:	44.7 million as of March 1, 1978, percent more than a year earlier
Trends:	Farmers are likely to turn increasingly to total confinement operations, and that may encourage further consolidation of hog farms.

Recent Publications



Single copies of the publications listed here are available free from *Farm Index*, Economics, Statistics, and Cooperatives Service, Rm. 252-GHI, 500 12th St. S.W., U.S. Department of Agriculture, Washington, D.C. 20250. However, publications indicated by (*) may be obtained only by writing to the experiment station or university. For addresses, see July and December issues of *Farm Index*.

Estimating U.S. Livestock and Poultry Manure and Nutrient Production. Donald L. Van Dyne, Commodity Economics Division, and Conrad B. Gilbertson, Science and Education Administration, USDA. ESCS-12.

As the value of livestock and poultry manure rises with the advent of new uses for it—such as energy production, fertilizer, and livestock feed—interest in how much is produced has grown. This report summarizes the manure production in the various States, by county. While most data are from 1974, current estimates of production may be obtained by multiplying factors in this report by estimates of current livestock population.

Dairy Price Policy: Setting, Problems, Alternatives. Alden C. Manchester, National Economic Analysis Division. AER-402.

Federal programs have been deeply imbedded in the economic fabric of the U.S. dairy industry for more than 40 years. The economic characteristics and performance of the industry have changed drastically, and further changes will surely come. Still, the basic structure of Federal dairy price policy and Federal dairy programs has not changed. This report discusses those programs.

Food Service in Puerto Rico's Schools. Michael G. Van Dress, National Economic Analysis Division. ESCS-13.

This report evaluates facets of child nutrition and food assistance programs and, in part, assesses the markets for food which these programs bring about. Data were gathered and processed by Market Facts, Inc. under a contract with USDA's Food and Nutrition Service.

Food Stamp Participation of Hired Farmworker Families. Leslie Whitener Smith and Gene Rowe, Economic Development Division. AER-403.

More than 200,000 hired farmworker families in the Food Stamp Program were interviewed for this report. It identifies the many factors that affect program participation. What comes out of the interviews is a socioeconomic profile of the families questioned.

Evaluation of Pesticide Supplies and Demand for 1978. Theodore R. Eichers and Paul A. Andrilenas, National Economic Analysis Division. AER-399.

This annual report gives manufacturers, distributors, growers, and policymakers comprehensive pesticide situation and outlook information. This year's publication features an expanded section on policy implications because of the increased interest among the public and regulatory bodies in pesticide use and distribution.

Notes on Agricultural Policy Issues: Discussions at the 1977 Meeting of the American Agricultural Economics Association. ESCS-16.

Condensing remarks made at a 1977 panel discussion, this report reflects thoughts on future challenges facing agricultural economists. The discussions range from environmental and resource considerations to liberalized trade and international market stability.

Regional Development and Plan Evaluation: The Use of Input-Output Analysis. Robert McKusick, Nelson Bills, Richard Clark, Clifford Jones, Robert Niehaus, Charles Palmer, Sterling Stipe, John Wilkins, and Linda Zygadlo, Natural Resource Economics Division. Ag. Handbook No. 530.

Input-output (I-O) analysis is examined in this study. Central is the plan evaluation process for water and related land resources by the Federal Government, which used I-O analysis. The authors emphasize evaluating the feasibility of resources plans for a regional economy, as opposed to project justification.

System Theory Applications to Agricultural Modeling. Edited by Alexander H. Levis, Systems Control, Inc., Palo Alto, California; and by Leroy Quance, National Economic Analysis Division. ESCS-07.

Seven papers are presented in this volume relating to the present and potential contributions of system theory to economic research and policy analysis in food and agriculture. The papers were originally presented at the Conference on Decision and Control in Clearwater, Fla., December 1-3, 1976. They were revised by the authors for inclusion in this book.

Adjustments in Agriculture and the Trade Act of 1974. Malcolm D. Bale, Foreign Demand and Competition Division. FAER-147.

The implications of the Trade Act of 1974 on U.S. agriculture were many and varied. This report discusses them, explaining how American Farmers adversely affected by liberalized foreign trade may receive adjustment assistance. Important changes in U.S. agricultural policy are explored.

Economic Trends

[1] Ratio of index of prices received by farmers to index of prices paid, interest, taxes, and farm wage rates. [2] Average annual quantities of farm food products purchased by urban wage earner and clericalworker households (including those of single workers living alone) in 1959-61—estimated monthly. [3] Annual and quarterly data are on 50-State basis. [4] Annual rates seasonally adjusted first quarter. [5] Seasonally adjusted. [6] As of March 1, 1967. [7] As of February 1, 1977.

Source: U.S. Dept. of Agriculture (Agricultural Prices, Foreign Agricultural Trade, and Farm Real Estate Market Developments); U.S. Dept. of Commerce (Current Industrial Reports, Business News Reports, Monthly Retail Trade Report, and Survey of Current Business); and U.S. Dept. of Labor (The Labor Force and Wholesale and Consumer Price Index).

Item	Unit or Base Period	1967	1977 Year	1977 Mar.	1978 Jan.	1978 Feb.	1978 Mar.
Prices:							
Prices received by farmers	1967=100	—	183	190	186	193	200
Crops	1967=100	—	192	211	188	190	198
Livestock and products	1967=100	—	175	171	185	196	204
Prices paid, interest, taxes, and wage rates	1967=100	—	202	202	209	211	214
Prices paid (living and production)	1967=100	—	197	196	201	203	206
Production items	1967=100	—	208	201	203	206	211
Ratio [1]	1967=100	—	91	94	89	91	93
Producer prices, all commodities	1967=100	—	194.2	192.0	199.9	202.0	203.8
Industrial commodities	1967=100	—	195.1	191.7	201.5	202.8	204.1
Farm products	1967=100	—	192.5	202.5	192.2	198.9	205.3
Processed foods and feeds	1967=100	—	186.1	183.9	191.3	194.6	196.8
Consumer price index, all items	1967=100	—	181.5	178.2	186.9	188.3	189.8
Food	1967=100	—	192.2	188.6	198.2	201.3	203.6
Farm Food Market Basket: [2]							
Retail cost	1967=100	—	179.2	178.3	184.2	188.1	190.7
Farm value	1967=100	—	179.1	177.5	186.2	191.3	199.5
Farm-retail spread	1967=100	—	179.3	178.8	183.0	186.0	185.1
Farmers' share of retail cost	Percent	—	39	39	39	39	41
Farm Income: [3]							
Volume of farm marketings	1967=100	—	124	106	133	101	100
Cash receipts from farm marketings	Million dollars	—	95,025	7,110	8,807	6,873	7,300
Crops	Million dollars	—	47,572	3,159	4,877	2,858	2,800
Livestock and products	Million dollars	—	47,453	3,951	3,930	4,015	4,500
Realized gross income [4]	Billion dollars	—	106.1	106.5	—	—	113.4
Farm production expenses [4]	Billion dollars	—	85.7	84.5	—	—	92.1
Realized net income [4]	Billion dollars	—	20.4	22.0	—	—	21.3
Agricultural Trade:							
Agricultural exports	Million dollars	6,380	23,671	2,293	1,938	2,068	2,519
Agricultural imports	Million dollars	4,452	13,459	1,300	1,247	1,222	1,394
Land Values:							
Average value per acre	Dollars	[6] 168	[7] 450	—	—	490	—
Total value of farm real estate	Billion dollars	[6] 182	[7] 482	—	—	527	—
Gross National Product: [4]	Billion dollars	796.3	1,889.6	1,810.8	—	—	1,992.9
Consumption	Billion dollars	490.4	1,211.2	1,172.4	—	—	1,284.0
Investment	Billion dollars	120.8	294.2	271.8	—	—	314.4
Government expenditures	Billion dollars	180.2	395.0	374.9	—	—	417.1
Net exports	Billion dollars	4.9	-10.9	-8.2	—	—	-22.6
Income and Spending: [5]							
Personal income, annual rate	Billion dollars	626.6	1,536.7	1,499.1	1,625.2	1,632.8	1,652.2
Total retail sales, monthly rate	Billion dollars	24.4	59.0	58.0	59.9	61.7	62.8
Retail sales of food group, monthly rate	Billion dollars	5.8	13.0	12.8	13.6	13.8	13.9
Employment and Wages: [5]							
Total civilian employment	Millions	74.4	90.5	89.5	92.9	93.0	93.3
Agricultural	Millions	3.8	3.2	3.2	3.4	3.2	3.3
Rate of unemployment	Percent	3.8	7.0	7.4	6.3	6.1	6.2
Workweek in manufacturing	Hours	40.6	40.3	40.4	39.6	40.0	40.5
Hourly earnings in manufacturing, unadjusted	Dollars	2.83	5.63	5.48	5.93	5.94	5.96
Industrial Production: [5]	1967=100	—	137.1	135.8	138.6	139.0	141.0
Manufacturers' Shipments and Inventories: [5]							
Total shipments, monthly rate	Million dollars	46,487	110,612	111,241	112,748	117,432	—
Total inventories, book value end of month	Million dollars	84,527	176,720	169,379	177,934	179,531	—
Total new orders, monthly rate	Million dollars	47,062	112,169	111,788	116,272	120,703	—

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